

Principles and Application of Hydrotherapy for Equine Athletes

Melissa King, DVM, PhD

KEYWORDS

- Hydrotherapy • Underwater treadmill exercise • Buoyancy • Osmolality
- Hydrostatic pressure • Viscosity

KEY POINTS

- Exercising in water is an effective treatment option for managing musculoskeletal injuries.
- Hydrotherapy provides an effective medium for increasing joint mobility, enhancing muscle activation, improving postural control, and reducing inflammation.
- Various forms of hydrotherapy are frequently prescribed for rehabilitation of equine musculoskeletal injuries with the goal of improving the overall function of the affected limb and preventing further injuries.

INTRODUCTION

Aquatic rehabilitation has long been recognized as having beneficial effects in humans. Hydrotherapy is a commonly prescribed treatment option for managing primary musculoskeletal injuries and reducing or limiting harmful compensatory gait abnormalities in people.¹ Exercising in water provides an effective medium for increasing joint mobility, promoting normal motor patterns, increasing muscle activation, and reducing the incidence of secondary musculoskeletal injuries caused by primary joint pathology.² Humans with lower extremity osteoarthritis show a significant increase in limb-loading parameters, improved joint range of motion, and a significant reduction in the severity of balance deficits following aquatic exercise.³ The enhancements in muscle strength and function associated with aquatic exercise also significantly improve proprioceptive deficits, poor motor control, and abnormal locomotor characteristics typically found in osteoarthritic adults.⁴

Author Declaration of Interests: No conflicts of interest have been declared.

Department of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, 300 west drake street, Fort Collins, CO 80526, USA

E-mail address: Melissa.king@colostate.edu

Vet Clin Equine ■ (2016) ■-■

<http://dx.doi.org/10.1016/j.cveq.2015.12.008>

0749-0739/16/\$ – see front matter Published by Elsevier Inc.

vetequine.theclinics.com

PROPOSED MECHANISMS OF ACTION

Hydrotherapy interventions, such as underwater treadmill exercise and swimming, have been reported to reduce mechanical stresses applied to the limb, improve joint range of motion, decrease pain and inflammation, improve muscle strength and timing, and increase cardiovascular endurance.⁵ The physical properties of water provide a medium where the mechanisms of increased buoyancy, hydrostatic pressure, and viscosity, along with the ability to alter temperature and osmolality, are applied in different combinations to play an important role in individualized musculoskeletal rehabilitation (**Fig. 1**). The increased resistance and buoyancy inherent in aquatic exercise increases joint stability and reduces weight-bearing stresses on muscles and joints.⁶⁻⁸ Immersion of the distal limb causes circumferential compression, which increases proportionately with water depth. The increased extravascular hydrostatic pressure promotes circulation and reduces edema.⁵ Hydrotherapy can also aid in decreasing pain through temperature effects. Immersion in warm water causes vasodilation, increased circulation, and decreased muscle spasms,⁹ whereas cold water acts to reduce inflammation by restricting blood flow and reducing the accumulation of inflammatory mediators.¹⁰ Aquatic conditions with higher solute concentrations provide an osmotic effect, which can ultimately reduce edema and decrease pain.¹¹ Hydrotherapy is a versatile treatment modality capable of producing a wide variety of therapeutic effects and therefore is considered an effective method for addressing sensory and motor disturbances associated with musculoskeletal injuries to achieve functional restoration of full athletic performance.¹²

Buoyancy

In the context of hydrotherapy, buoyancy is defined as a lifting force that acts to reduce axial loading of the joints by minimizing vertical ground reaction forces. Underwater force platform analysis of human subjects demonstrates a significant reduction

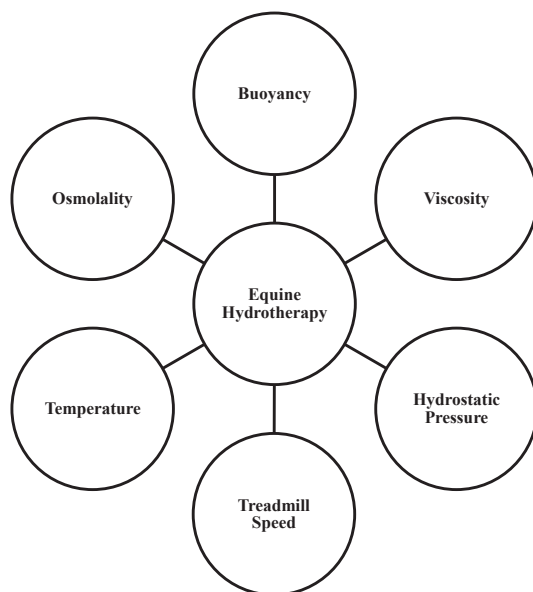


Fig. 1. Graph illustrating the combined variables involved in hydrotherapy.

Download English Version:

<https://daneshyari.com/en/article/2458781>

Download Persian Version:

<https://daneshyari.com/article/2458781>

[Daneshyari.com](https://daneshyari.com)